

by his corps of assistants. Full-length text-figures illustrate 22 of the species treated. This opportune compilation cannot be too widely distributed, as it carries convincing evidence of the great economic importance of bird life to agriculture.

Another important and instructive paper recently issued under the same auspices is Dr. T. S. Palmer's 'Extermination of Noxious Animals by Bounties.'¹ Reference is made to both mammals and birds, and the conclusion is reached that this method of attempting the extermination of noxious animals is both expensive and futile. The objections to the system are (1) that the expense is out of all proportion to the benefit gained; (2) the impossibility of maintaining bounties in all parts of an animal's range; (3) the impossibility of maintaining equal rates in all States; and (4) the impossibility of preventing fraud, as the payment of bounties on animals imported from outside areas, or especially raised for the purpose, or for 'counterfeit scalps,' innocent species being palmed off on the ignorant official for injurious ones. This is especially liable to occur in the case of birds, and notably where bounties are offered for the House Sparrow. The statistics here given show that during the last twenty-five years not less than 3,000,000 of dollars have been expended for bounties within the United States, with the result that not a single species has thereby been exterminated, and, in most cases, with little benefit. As the custom of offering bounties is, however, apparently on the increase, this timely exhibit of how the scheme works ought to be of advantage as regards the future. The matter of holding the really noxious species in check by other methods is also intelligently discussed.—J. A. A.

Whitlock's Review of Herr Gätke's Views on the Migration of Birds.²—In this extended critique of Herr Gätke's 'Heligoland,' the writer disclaims "any feelings towards Herr Gätke but those of the warmest admiration and respect." He says he "looked forward to the appearance of Herr Gätke's long-expected work with the greatest interest. On its first perusal, the novelty of the author's statements greatly impressed me, and after careful study I found them very difficult of acceptance." He then, he says, formed the plan of writing a paper on it for one of the current ornithological journals, but he soon found the subject too great to render this practicable, and hence this separate form of publication. His "sole aim has been to place the other side of the question" before his readers. Of Herr Gätke's work he says: "The opinions he expresses, on the

¹ Yearbook of the U. S. Department of Agriculture for 1896 (1897), pp. 55-68.

² The Migration of Birds | A Consideration of Herr Gätke's Views | By | F. B. Whitlock | Author of "Birds of Derbyshire," etc., etc. | (All rights reserved) | London | R. H. Porter | 7, Princes Street, Cavendish Square, W. | 1897.—8vo, pp. vi + 140. (Price, 3s. 6d. net.)

special department of ornithological science, for the study of which Heligoland is so pre-eminently adapted, will naturally have the greatest weight with all, and some in their admiration for the veteran observer have formed the opinion, that all, or nearly all of our previous conceptions, as to the direction, altitude and velocity of the migratory flight, will have to be greatly modified or altogether abandoned in favour of those he sets before us."

After a few pages of introductory remarks, Mr. Whitlock takes that part of Herr Gätke's 'Heligoland' treating of the 'Migration of Birds' (pp. 3-148, English ed.), to which he chiefly confines his remarks, systematically taking up the various points that are especially Gätkean. Space will not permit us to follow Mr. Whitlock's critical analysis of Herr Gätke's many extraordinary statements regarding plain matters of fact, to say nothing of his astonishing inferences and assumptions. As to the former, our author says, with an evident feeling of kindness: "It will be readily admitted that to arrive at an accurate result in calculating the numbers of rapidly moving objects is very difficult. It is equally difficult to arrive at a proper estimate of the value we are to place on the author's computations. In particular instances the reader can hardly fail to be struck by evidence of the grossest, though no doubt unintentional, exaggeration. This must perhaps be attributed to the artistic element in Herr Gätke's nature." (p. 11.)

Mr. Whitlock combats at length Gätke's theory of a general east and west migration, and migration by a 'broad front' as against fly lines, bringing much evidence against it from even Gätke's own statements. After an extended discussion of the subject he says (p. 39): "It is difficult to see on what grounds Herr Gätke has based his theory that the general course of migration tends from east to west."

The absurdity of many of Gätke's theories and assumptions is mercilessly exposed by Mr. Whitlock's simply bringing to bear upon them a little common sense and well-known physical laws, especially on the supposed 'altitude' and 'velocity' of migration flight and the assumed influence thereon of certain meteorological conditions.

In regard to Gätke's objections to current views on the "cause of the migratory movement," and on "what guides birds during their migrations," Mr. Whitlock says of the former (p. 114): "It has been previously pointed out that so far from enunciating any theory of his own . . . Herr Gätke frankly avows himself disinclined to undertake the task. The chapter in his work he devotes to the question is, therefore, nothing but a statement of his objections to the theories of others. . . . It is, perhaps, not to be wondered that he should feel disinclined to put forth any theory of his own, committed as he already is to the statements on the direction, altitude and velocity of migration flight as detailed in previous pages. No theory that could be devised would be likely, in all its details, to fit in with such various speculations, and he may well look upon the task as hopeless." Later on (p. 120) Herr Gätke's theories of

migration flight of a flock of birds from their breeding grounds in the northeast to their winter quarters in the southwest of Europe is thus acutely summarized: "Let us suppose that we are dealing with one of the 'many hundreds' which pass Heligoland on their journeys from 'far eastern Asia.' It is dusk—and the time for departure has arrived. Without more flocking together than has accidentally taken place during feeding time, all the residents in a particular area set out from their breeding grounds on a journey of two thousand miles or more. No food has been taken for some hours, and the winds being unfavourable near the surface of the earth, all rise to a height of at least 20,000 feet, whence guided by some unknown power, and at a speed of 150 to 200 miles an hour, they set out on their rushing and undeviating flight to the west of Europe. Here, however, the direction of the latter must be altered and a turn to the south executed in mid-air, which carries them, after a further flight, to the neighborhood of Heligoland, where again a second turn is accomplished and the remainder of the journey is performed in the old undeviating westerly direction, until dawn finds them at their goal on the shores of England; neither tired nor hungry after their great exertions." This is a fair statement of Herr Gätke's theories on this subject, and needs no comment to render their absurdity apparent to any thoughtful ornithologist.

"In estimating the value of his [Herr Gätke's] theories," says Mr. Whitlock (p. vi), "it must not be forgotten that they are based on observations conducted in a very limited and somewhat exceptionally situated area; outside this area his personal experience seems to have been very small." (Cf. Auk, XIII, 1896, p. 138, 139). Add to this his lack of scientific training, his evident but doubtless unconscious tendency to exaggeration, and an imaginative turn of mind, and we need not seek further for an explanation of the overdrawn statements and ridiculous speculations found in 'Heligoland.'

Mr. Whitlock has done good service to ornithology in publishing his, on the whole, temperate, and well-considered critique of a work that is both a valuable and an unfortunate contribution to ornithology, as the exaggerations and wild speculations it contains are the parts seized upon with greatest avidity by the thoughtless compiler for introduction broadcast into the popular literature of ornithology. It need hardly be said, in conclusion, that Mr. Whitlock's book will not prove very agreeable reading matter to the many who have idealized and idolized the author of 'Heligoland.'—J. A. A.

Suchetet on Hybrids among Wild Birds.¹—In a thick octavo volume of 1154 pages Mr. Suchetet has brought together all the facts he has been

¹ Des | Hybrides | à | l'état sauvage | — | Règne Animal | — | Tome Premier | Classe des Oiseaux | Par | André Suchetet. | . . . [Motto] | — | Paris | Libraire J.-B. Baillière et Fils | 19, Rue Hautefeuille, 19 | 1897 — Large 8vo, pp. clii + 1002. (Price, 28 fr.)